

**REMARKS**

Claims 1-47 are pending. Claims 1-47 are rejected. Claims 1, 6, 18, and 46-47 are amended. New claims 48-51 are added. No new matter has been added and the new claims are fully supported by the Specification.

The Office Action objects to the absence of an abstract, which is required by 37 CFR 1.72(b). Applicant respectfully submits the enclosed abstract.

Claims 1-47 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-20 of co-pending Application No. 09/926,397. Although the conflicting claims are admittedly *not identical*, the Examiner contends that these claims are not patentably distinct from each other because they are both drawn to methods of isolating sterols from neutral substances obtained from soap.

Applicant notes the obviousness-type double patenting rejection and respectfully requests an abeyance while other issues regarding the present application remain outstanding. Applicant will address the materiality of the double patenting rejection at the time the application is allowed.

Claims 18-33 are objected to under 37 CFR 1.75 as being a substantial duplicate of claims 1-16. The Office Action asserts that duplicate claims may be slightly different in their wording, but they essentially cover the same thing. Applicant respectfully traverses this objection.

Applicant submits that the objection is without merit. Applicant points out that independent claim 1 and independent claim 18 are generally similar in their wording, but

there are a number of features distinguishing them from one another. For instance, step (a)(1) in each claim is different. Claim 1 claims "providing a mixture comprising (1) the soap containing the *neutral substances*." Additionally, claim 18 claims "providing a mixture comprising (1) the soap containing the *sterols*." In addition, step (3) in claim 18 differs from step (3) in claim 1. Claim 18 claims the *purification of sterols*, while claim 1 claims an *optional separation of neutral substances*. Applicant notes that the sterols are purified from neutral substances, and sterols are likely to be a more refined product than neutral substances. Accordingly, claim 18 is more specific than claim 1. For at least these reasons, claims 1 and 18 are distinct and reconsideration and withdrawal of the objection are respectfully requested.

Claim 6 is objected to under 37 CFR 1.75(c) as having an improper dependent form for failing to further limit the subject matter of a previous claim. Claim 6 recites "a weight ratio of 1: 1-3: 2-6," which the Office Action asserts is broader than the weight ratio of 1: >1: >1 as recited in claim 5. Per the Office's request, Applicant respectfully submits an amended version of claim 6.

Claims 1-47 are rejected under 35 USC 103(a) as being unpatentable over US Patent No. 2,530,810 to Christenson et al ("Christenson") and PCT Publication No. WO 96/10033 to Novak et al ("Novak") in combination. The Office asserts that the combination of Novak and Christenson teaches all the steps claimed in the present invention. Specifically, the Office asserts that Christenson teaches all of the steps claimed in the present invention, with the exception of the extraction temperature range. The Office relies on the disclosure of Novak to supply the deficiencies of Christenson. The Office further asserts that the motivation to combine the teachings of Novak and

Christenson would be obvious to one skilled in the art.

The Christenson reference discloses a method of separation of unsaponifiable matter from tall oil residue. According to Christenson, a solution of unsaponifiable matter in aqueous alcohol is extracted using a solvent such as naphtha, chlorinated hydrocarbons, ethers and the like, to obtain a fraction highly enriched in unsaponifiable matter. The extraction is conducted at 75° to 145° F, but depending on the type of alcohol used, may be as high as 160° to 170° F. Christenson also discloses the possibility of conducting the extraction at temperatures of 180° to 200° F, so long as the vapor pressure in the system does not become excessive. The extract solution is washed with water to remove the residual soaps. Subsequently, the solvent from the extract solution is evaporated before refining the sterols by crystallization. Finally, the sterols are separated from the crystallization solvent. See Christenson, column 2, lines 33-48, column 3, lines 59-75, column 4, lines 1-14, and column 10, lines 13-17.

The Novak reference discloses preparation and purification of sterol compositions from pulping soap. During the extraction phase disclosed by Novak, soap is mixed with a ketone and water solution. A hydrocarbon is used to extract the sterols. Thus, the extraction process is conducted using a ketone-water-hydrocarbon solvent. The extraction is generally performed at temperatures ranging from 25° to 150° C, but most preferably from 50° to 100° C. Novak specifically states that the use of alcohol is neither required nor suggested during the extraction phase. The purification phase may be conducted by crystallization in which the creamy precipitate from the extraction phase is dissolved in alcohol, cooled slowly, then filtered and washed with cold alcohol. See Novak, page 9, lines 16-23 and page 10, lines 1-5.

Independent claim 1 claims a method for separating neutral substances from a soap containing neutral substances. Specifically, it claims an extraction mixture comprising soap containing neutral substances, water optionally containing sodium sulfate, and a C<sub>1</sub>-C<sub>10</sub> hydrocarbon solvent. The mixture is heated to a temperature of at least 140° C to obtain a soap phase and a hydrocarbon phase containing neutral substances. This heating step is conducted in a closed system under pressure, wherein the pressure in the system is at least equal to the vapor pressure of the mixture at the temperature used in the heating step. Subsequently, the hydrocarbon phase is separated from the soap phase. The neutral substances may be optionally separated from the hydrocarbon phase.

Independent claim 18 claims a method for purifying sterols from a soap containing sterols. Specifically, it claims an extraction mixture comprising soap containing sterols water optionally containing sodium sulfate, and a C<sub>1</sub>-C<sub>10</sub> hydrocarbon solvent. The mixture is heated to a temperature of at least 140° C to obtain a soap phase and a hydrocarbon phase containing neutral substances. This heating step is conducted in a closed system under pressure, wherein the pressure in the system is at least equal to the vapor pressure of the mixture at the temperature used in the heating step. Subsequently, the hydrocarbon phase is separated from the soap phase. The sterols are purified from the hydrocarbon phase.

Applicant respectfully traverses the obviousness rejection. Applicant submits that the obviousness rejection does not have merit for at least the following reasons: 1) the Christianson and Novak references are not combinable; and 2) the references do not teach or suggest every step of the present invention.

Applicant traverses the obviousness rejection based on the fact that the references are not combinable, and thus, the rejection is improper. Applicant contends that there is no motivation to combine Christenson and Novak. In fact, it is submitted that the references seem to specifically teach away from one another. Christenson teaches that soaps of tall oil pitches can be made in solutions of varying concentrations of the soaps in a water-alcohol mixture of varied alcohol concentration. Furthermore, in most instances, the solvent, which includes naphtha, chlorinated hydrocarbons, and ethers, employed to extract the unsaponifiable matter from the alcohol-water solution, will be in a ratio at least as high as 1:1 with respect to the soap solution. The net result is that alcohol is present in the extraction phase. Christenson, column 3, lines 59-75 and column 4, lines 1-14. Novak, however, expressly teaches away from the use of alcohol in the extraction phase. Novak, page 9, lines 16-23. The teachings in the two references thus appear to be incompatible, and therefore, would not have been combined by one skilled in the art.

Applicant also traverses the Office's assertion that the references teach or suggest the step to avoid emulsion formation, i.e., the extraction step. Applicant points out that the step to avoid emulsion formation in the present invention is not the same as the step to avoid emulsion in the references. For instance, Christenson uses an alcohol and Novak uses a ketone to avoid emulsion formation, in addition to the hydrocarbon extraction solvent. In contrast, Applicant does not add either alcohol or ketone to avoid emulsion formation. In fact, Applicant's method teaches away from the use of either alcohol or ketone. See Specification, page 3, third full paragraph. Applicant's method to avoid emulsion formation claimed in independent claims 1 ad 18 involves the use of

high temperature and high pressure to accomplish this objective.

In order to expedite prosecution of this application and to even more clearly distinguish the cited references from the presently claimed invention, Applicant amends claim 1 and 18 to require the absence of alcohol and/or ketone in step (a). No new matter has been added to claims 1 and 18; this amendment is supported throughout the specification (see, for example, page 3, third full paragraph).

Dependent claims 2-17 and 19-47 are also rejected as being obvious in view of Christenson and Novak. Applicant submits that these claims depend on claims 1 and 18, respectively, and therefore claims 1-17 and 19-47 should also be allowed for at least the same reasons.

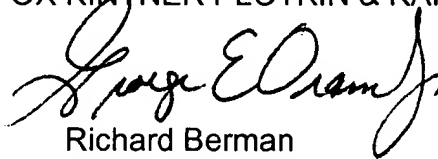
For at least the above reasons, reconsideration and withdrawal of the rejection under 35 U.S.C. § 103(a) are respectfully requested.

In view of the foregoing, reconsideration of the application, withdrawal of the outstanding rejections, allowance of claims 1-51, and the prompt issuance of a Notice of Allowability are respectfully solicited.

Should the Examiner believe anything further is desirable in order to place this application in better condition for allowance, the Examiner is requested to contact the undersigned at the telephone number listed below.

In the event this paper is not considered to be timely filed, the Applicants respectfully petition for an appropriate extension of time. Any fees for such an extension, together with any additional fees that may be due with respect to this paper, may be charged to counsel's Deposit Account No. 01-2300, **referencing docket number 023406-00006.**

Respectfully submitted,  
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